

Notice of Allowability

Application No.

10/777,941

Examiner

David A. Vanore

Applicant(s)

CHO ET AL.

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response filed on March 14, 2006.
2. ☒ The allowed claim(s) is/are 1,3-9,11 and 12.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/598,656.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

David A Vanore
Patent Examiner
Art Unit: 2881

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see the remarks, filed March 14, 2006, with respect to claims 1, 3-9, and 11-12 have been fully considered and are persuasive. The rejection of claims 1, 3-9, and 11-12 has been withdrawn.

Election/Restrictions

2. Claim 1 is generic and allowable. Accordingly, the restriction requirement as to the encompassed species is hereby withdrawn and claims 6-9, directed to the species of the method of probe manufacture where boron is diffused within the probe via heat treatment are no longer withdrawn from consideration since all of the claims to this species depend from or otherwise include each of the limitations of an allowed generic claim.

3. In view of the above noted withdrawal of the restriction requirement as to the linked species, applicant(s) are advised that if any claim(s) depending from or including all the limitations of the allowable generic linking claim(s) be presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

4. Claims 1, 3-9, and 11-12 are currently pending.

Allowable Subject Matter

5. Claims 1, 3-9, and 11-12 are allowed.
6. The following is an examiner's statement of reasons for allowance:
7. The prior art fails to teach or suggest the method recited in claim 1, where there are two features which when taken together and with the other limitations of the claim, elevate the claim over the prior art.
8. Firstly, the step of providing silicon with a $\langle 110 \rangle$ direction when taken with all the other limitations of the claim, overcomes the prior art. The applicant correctly argues that the prior art previously relied upon of Toda et al. (USPN 5,386,720) does not teach a silicon substrate having a $\langle 110 \rangle$ directional crystal structure. The examiner cites Kasap, "Principles of Electrical Engineering Materials and Devices", ISBN 0-256-16173-9, at pages 48-51. The term " $\langle 110 \rangle$ " is in the form of a Miller index. This index indicates direction or features of a crystal structure. Of critical importance in the Miller index is the notation, which surrounds the three digit index. Note Kasap at page 49. The bracket index " $\langle \rangle$ " indicates all the directions along the edges of a unit crystal constitute equivalent directions. In the instant case, the relied upon teaching of Toda et al. at Col. 6 Lines 1-15 recites a patterning shape extending in (110) direction of the silicon wafer. Noting Fig. 1.40 at page 50 of Kasap, this parenthetical notation " $()$ " is indicative of a single plane in the crystal lattice, and is therefore not indicative of the crystal structure of the claimed silicon crystal as a whole. The prior art does not teach a method of manufacture recited in steps "b" through "o" of claim 1 where the silicon substrate provided has a $\langle 110 \rangle$ directional crystal structure.

9. Secondly, the claim has been amended to recite that the boron diffused layer in step "i" of claim 1, is diffused only into a portion of the silicon substrate to be formed with the cantilever and body. In the prior art of Toda et al., boron is implanted into a silicon substrate (Item 127), however this element is utilized to only form a portion of the cantilever, or arm, of the probe. Note Fig. 8K illustrating cantilever elements 133 and 127, and body element 141. There is no apparent motivation at hand to show that it would be obvious to one of ordinary skill, when taken with steps "a" through "h" and steps "j" through "o", to further limit the boron diffusion set forth in step "i" of claim 1.

10. For at least these reasons, claim 1 is allowable over the prior art. Claims 3-9 and 11-12 are allowable by virtue of their dependency.

11. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Vanore whose telephone number is (571) 272-2483. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David A Vanore
Patent Examiner
Art Unit 2881

4/11/06

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